

REMARKS

In this Amendment, Applicants amend claims 1 and 3 – 6 to more appropriately define the present invention, amend claims 4 – 6 to correct claim dependency (not for reasons related to patentability), amend claims 4 – 6 and 13 – 18 to correct Markush-group language (not for reasons related to patentability), and add new claims 19 – 21 to protect additional aspects related to the present invention. Upon entry of this Amendment, claims 1 – 6 and 13 – 21 remain pending and under current examination.

Regarding the Office Action:

In the Office Action, the Examiner alleged that Applicants have not complied with one or more conditions for receiving the benefit of priority under 35 U.S.C. § 120; objected to the title; advised that should claims 4 – 6 be found allowable, claims 13 – 18 would be objected to under 37 C.F.R. § 1.75 as being a substantial duplicate thereof; objected to the Markush groupings in claims 4 – 6 and 13 – 18; rejected claims 1, 3, and 16 – 18 under 35 U.S.C. § 102(b) as anticipated by Krishnan, et al. (U.S. Patent No. 5,451,551); and rejected claims 2, 4 – 6, and 13 – 15 under 35 U.S.C. § 103(a) as unpatentable over Krishnan and Bothra (U.S. Patent No. 6,297,557).

Applicants appreciate the Examiner's thorough examination of this application, especially the detailed citations which aided Applicants in reviewing the Examiner's comments. Nevertheless, Applicants respectfully traverse the objections and rejections, as detailed above, for the following reasons.

Regarding the Amendments to claims 1, 3 – 6, and 13 – 18, and New Claims 19 – 21:

Applicants amend claims 1 and 3 – 6 to more appropriately define the present invention, amend claims 4 – 6 to correct claim dependency (not for reasons related to patentability), amend

claims 4 – 6 and 13 – 18 to correct Markush-group language (not for reasons related to patentability).

Specifically, Applicants have amended claims 1 and 3 – 6 to remove language such as “a step of,” to replace “step” with “operation,” and to replace “a first polishing step” with “a first polishing operation.”

Applicants submit that the amendments contain no new matter, in accordance with the requirements of 37 C.F.R. § 1.121(f). Applicants respectfully point out that “[a]mendments to an application which are supported in the original description are NOT new matter.” M.P.E.P. § 2163.07, emphasis in original.

Applicants add new claims 19 – 21 to protect additional aspects related the present invention. New claims 19 – 21 find support in the original specification, among other places, on pages 6, 14, 19, and 20.

Applicants submit that these amendments should render the application in condition for allowance after consideration of the remarks that follow, and should not place any burden on the Examiner insofar as raising new issues or requiring further searches of the art to reconsider the rejected claims.

Regarding Applicants’ Claim for Priority:

The Examiner alleged that Applicants have not complied with one or more conditions for receiving the benefit of priority under 35 U.S.C. § 120. Specifically, the Examiner indicated that “[t]his application lacks the necessary reference to the prior application” (Office Action, p. 2). Applicants respectfully disagree, and direct the Examiner’s attention to the Transmittal Letter, dated June 23, 2003, which accompanied the filing of this application. In that Transmittal Letter, on p. 2, item 9, the specification was amended to include reference to the prior application.

Applicants therefore deem their compliance full and complete for receiving the benefit of priority under 35 U.S.C. § 120.

Regarding the Objection to the Title:

The Examiner objected to the title as “not descriptive” (Office Action, p. 2). In response, Applicants have amended the title, as it appears above, to be “clearly indicative of the invention to which the claims are directed.” Id. Applicants deem this objection overcome.

Regarding the Claim Objections:

1. The Examiner “advised that should Claims 4 to 6 be found allowable, Claims 13 to 18 will be objected to under 37 C.F.R. 1.75 as being a substantial duplicate thereof,” and “notes that it is only the dependencies of Claims 4 to 6 on Claims 2 and 3 that this objection applies” (Office Action, p. 2). In response, Applicants have amended claims 4 – 6 to correct claim dependency, as indicated above, and accordingly deem this objection overcome.

2. The Examiner indicated that the “Markush groupings in Claims 4 to 6 and 13 to 18 should be put in the proper phrasing, “...selected from the group consisting of...”. See MPEP §2173.05(h).” Id. In response, Applicants have amended claims 4 – 6 and 13 – 18 to correct Markush-group language (not for reasons related to patentability), and accordingly deem this objection overcome.

Regarding the Rejection of Claims 1, 3, and 16 – 18 under 35 U.S.C. § 102(b):

Applicants respectfully traverse the Examiner’s rejection of claims 1, 3, and 16 – 18 under 35 U.S.C. § 102(b) as anticipated by Krishnan.

In order to properly establish that Krishnan anticipates Applicants’ claimed invention under 35 U.S.C. § 102, each and every element of each of the claims in issue must be found, either expressly described or under principles of inherency, in that single reference.

Furthermore, “[t]he identical invention must be shown in as complete detail as is contained in the ... claim.” See M.P.E.P. § 2131, quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). Regarding the 35 U.S.C. § 102(b) rejection, Krishnan does not teach each and every element of Applicants’ present invention as claimed, which will be demonstrated below.

The Examiner alleged that Krishnan shows “a first polishing step 40 with $R_1 \geq 1$ and a second polishing step 30 with $R_2 \leq 1$ ” (Office Action, p. 3). Krishnan, however, only discloses that the polishing step using the pad 40 is performed after the cap film 34 is deposited. The polishing step using the pad 30 is performed before, rather than after, the cap film 34 is deposited. See Krishnan, Figs. 4 – 8, and col. 3, line 58 to col. 4, line 40.

It is therefore clear that Krishnan does not disclose at least Applicants’ claimed “*performing a first polishing operation at selectivity of R_1 (= removal rate for the cap film/removal rate for the insulating film); and performing a second polishing operation at selectivity of R_2 (= removal rate for the cap film/removal rate for the insulating film), wherein each of the first polishing operation and the second polishing operation is performed by using a slurry having a condition of $R_1 > R_2$* ” (Applicants’ independent claim 1, italics added).

Nothing in Krishnan discloses or even suggests at least this element of Applicants’ independent claim 1, since Krishnan’s polishing steps are before and after the formation of the caps film. Therefore, Applicants respectfully draw the Examiner’s attention to at least this difference between Krishnan and the present claimed invention. Thus, Krishnan fails to disclose at least the above-quoted elements of Applicants’ independent claim 1, and is different from the present invention for the reasons just presented.

Therefore, Applicants submit that Krishnan does not anticipate Applicants' claimed invention and does not disclose an identical invention in as complete detail as contained in Applicants' independent claim 1. Applicants therefore submit that the Examiner has not met these essential requirements of anticipation for a proper 35 U.S.C. § 102(b) rejection, and that independent claim 1 is allowable, for the reasons presented above. In addition, Applicants submit that dependent claims 3 and 16 – 18 are also allowable at least by virtue of their dependence from allowable base claim 1. Therefore, Applicants respectfully request that the Examiner withdraw the improper 35 U.S.C. § 102(b) rejection of claims 1, 3, and 16 – 18.

Regarding the Rejection of Claims 2, 4 – 6, and 13 – 15 under 35 U.S.C. § 103(a):

Applicants respectfully traverse the Examiner's rejection of claims 2, 4 – 6, and 13 – 15 under 35 U.S.C. § 103(a) as unpatentable over Krishnan and Bothra. Applicants respectfully disagree with the Examiner's arguments and conclusions, and respectfully submit that a *prima facie* case of obviousness has not been established.

In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim elements. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine reference teachings. Third, there must be a reasonable expectation of success. *See* M.P.E.P. § 2143.

The Examiner does not show that all the elements of Applicants' claims are met in the cited references, does not show that there is any suggestion or motivation to modify the cited references to result in the claimed invention, and does not show there would be any reasonable expectation of success from so doing.

Prior Art Reference Must Teach or Suggest All the Claim Elements

Applicants respectfully point out that the first requirement for establishing a *prima facie* case of obviousness has not been established: namely, Krishnan, whether taken alone or in combination with Bothra, does not teach or suggest each and every element of Applicants' claimed invention. This is evidenced from the arguments that follow.

Applicants have already demonstrated in the previous section that Krishnan does not teach or suggest all the recitations of Applicants' independent claim 1, in addition to the Examiner's admitted deficiencies of Krishnan. *See* Office Action, p. 4, for example. The Examiner's application of Bothra to allegedly teach aspects of Applicants' dependent claims (*See* Office Action, p. 4, for example), still does not cure Krishnan's deficiencies previously pointed out by Applicants, in that neither reference teaches nor suggests at least Applicants' previously-quoted elements of their independent claim 1.

In addition, Bothra, taken alone or in combination with Krishnan, does not teach or suggest all the features of Applicants' claimed invention, and therefore the Examiner's application of Bothra as a reference does not render the recitations of Applicants' claims obvious. Applicants point out that Bothra fails to cure the deficiencies of Krishnan when applied to Applicants' independent claim 1.

Therefore, the Examiner's application of Krishnan and Bothra as references does not satisfy the tenants of a proper 35 U.S.C. § 103(a) rejection of Applicants' dependent claims 2, 4, 6, and 13 – 15 in light of their dependence from allowable base claim 1. The Examiner has therefore not met an essential criteria for establishing a *prima facie* case of obviousness, wherein "the prior art reference (or references when combined) must teach or suggest all the claim limitations." *See* M.P.E.P. §§ 2142, 2143, and 2143.03.

*Lack of Suggestion or Motivation to Modify or Combine Reference Teachings,
and Lack of Reasonable Expectation of Success, for Prima Facie Obviousness*

The M.P.E.P. sets forth:

“Obviousness can only be established by combining or modifying the teaching of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” “[I]t is necessary to ascertain whether or not the reference teaching would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification.” M.P.E.P. § 2143.01, emphasis added.

One skilled in the art would only arrive at the present claimed invention by consulting Applicants’ disclosure, yet “[t]he teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on [A]pplicant’s disclosure.” M.P.E.P. § 2142, internal citations omitted. However, the Examiner is tacitly relying on Applicants’ present invention in an attempt to provide some teaching or suggestion to combine Krishnan with Bothra, by alleging that “[i]t would have been obvious to a person of ordinary skill in the art at the time of [the] invention to make a cap film thinner than the recess in an insulating layer as taught by Bothra” (Office Action, p. 4). Applicants submit that the teachings of Krishnan and Bothra still do not provide the requisite motivation to one of ordinary skill in the art to facilitate their combination, *from within the references themselves*, implicitly or otherwise. Applicants also note that one of ordinary skill in the art must have this motivation or reason *without the benefit of Applicants’ specification* to modify the references.

Applicants therefore submit that one of ordinary skill in the art would not have been motivated to combine Krishnan with Bothra, as there is nothing in particular to gain from such a

combination, as what is obtained still does not lead one of ordinary skill in the art at the time the invention was made to improve either or both of Krishnan's pre- and pos- caps layer polishing steps, and Bothra's method of fabricating Al interconnect via structures in a manner that would achieve the present claimed invention. Applicants respectfully remind the Examiner that "[t]he initial burden is on the Examiner to provide some suggestion of the desirability of doing what the inventor has done." M.P.E.P. § 2142. The prior art references themselves must provide the motivation to combine, and the presently applied references clearly fail to do so, therefore failing to provide some suggestion of the desirability of doing what Applicants have done.

As already demonstrated, the combination of these references as postulated by the Examiner *a priori* fails to establish obviousness of the claimed invention. Furthermore, Applicants have pointed out deficiencies in the cited prior art that render nugatory any indication that the cited references would give any motivation or reason to one of ordinary skill in the art to modify them *without the benefits of Applicants' specification*.

Therefore, even the Examiner's application of Bothra still does not establish that there would have been the requisite suggestion or motivation to modify Krishnan with Bothra. "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." M.P.E.P. § 2143.01, p. 2100-126, citing *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (emphasis in original).

In addition, regarding the required reasonable expectation of success, as evidenced from previous arguments regarding Krishnan and Bothra, Applicants submit that there would be no reasonable expectation of success to be derived from modifying Krishnan with Bothra, as this would diverge from the present invention, as claimed in Applicants' independent claim 1. This

also demonstrates that the Examiner's reliance on Krishnan and Bothra is not sufficient to establish *prima facie* obviousness.

Since Applicants have already demonstrated the deficiencies in the cited references and that they do not provide any suggestion or motivation to produce the present claimed invention, it logically flows that there would be no reasonable expectation of success expected by one of ordinary skill in the art when combining Krishnan with Bothra.

In summary, the Examiner has not met any of the essential criteria for establishing a *prima facie* case of obviousness. Applicants have demonstrated above that the Examiner: (a) has not shown that all recitations of Applicants' claimed invention are taught or suggested by Krishnan and Bothra; (b) has not shown any requisite suggestion or motivation to modify Krishnan with Bothra to produce Applicants' claimed invention; and (c) has not shown there would be any reasonable expectation of success from modifying Krishnan with Bothra in order to produce the present claimed invention. Thus, Applicants submit that the Examiner's reliance on these references fails to establish *prima facie* obviousness.

Regarding dependent claims 2, 4 – 6, and 13 – 15:

Finally, Applicants note that the M.P.E.P. sets forth that "[i]f an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious." M.P.E.P. § 2143.03. Therefore, Applicants submit that independent claim 1 is allowable, for the reasons argued above. In addition, dependent claims 2, 4 – 6, and 13 – 15 are also allowable at least by virtue of their dependence from allowable base claim 1. Therefore, Applicants respectfully request that the Examiner withdraw the 35 U.S.C. § 103(a) rejection.

Conclusion:

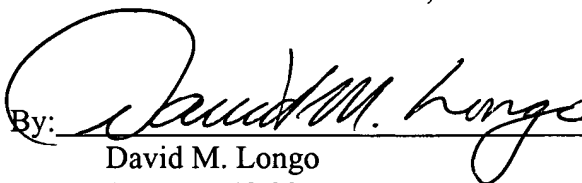
In view of the foregoing, Applicants request reconsideration of the application and submit that the objections and rejections detailed above should be withdrawn. This Amendment should allow for immediate and favorable action by the Examiner. Applicants submit that the pending claims are *prima facie* in condition for allowance. Applicants therefore request a favorable action in the form of issuance of a Notice of Allowance.

Should the Examiner continue to dispute the patentability of the claims after consideration of this Amendment, Applicants encourage the Examiner to contact Applicants' undersigned representative by telephone to discuss any remaining issues or to resolve any misunderstandings. Applicants' undersigned representative would welcome the opportunity to discuss the merits of the present invention with the Examiner if telephone communication will aid in advancing prosecution of the present application.

Please grant any extensions of time under 37 C.F.R. § 1.136 required in entering this response. If there are any fees due under 37 C.F.R. § 1.16 or 1.17, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our deposit account 06-0916.

Respectfully submitted,

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